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ARCHITECT

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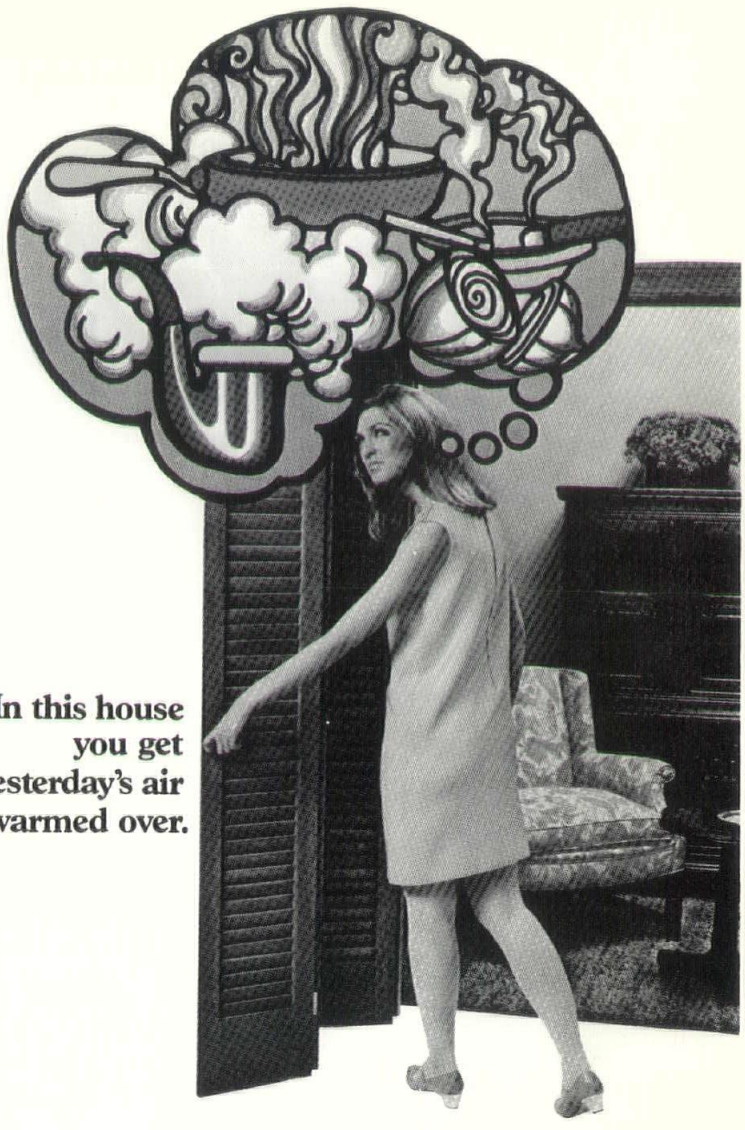

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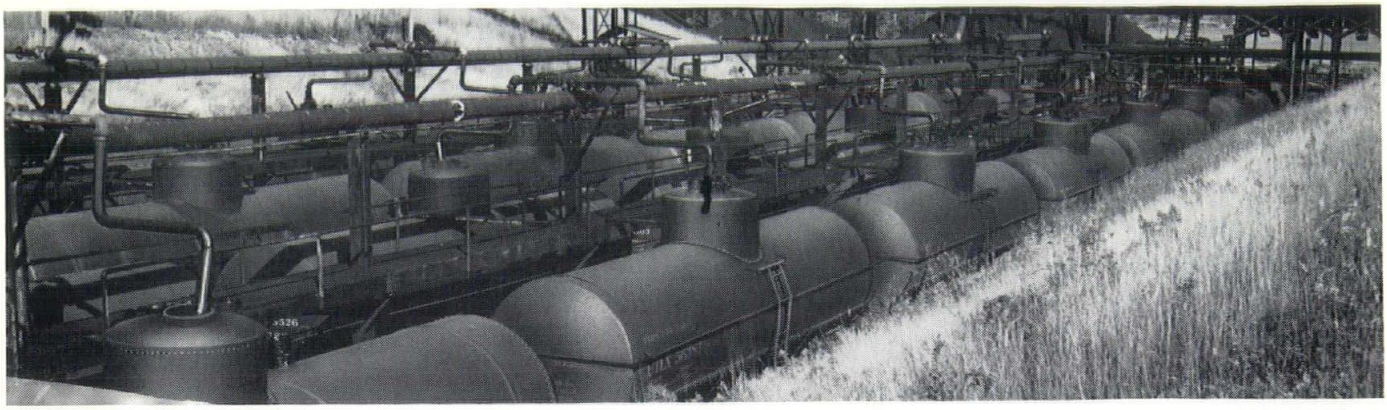

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GRANITE STATE

ARCHITECT

VOLUME V NUMBER 1
FEBRUARY, 1968

Cover: Administration building, Havenwood Retirement Community, Concord. Guy K. C. Wilson, Architect.

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Notes And Comments

REACH OCTAGON GOAL

The drive conducted by the American Institute of Architects to raise funds for a new headquarters building and for the restoration of the Octagon, in Washingon, D.C., has been completed successfully, according to John A. Carter, New Hampshire fund chairman.

Work will begin as soon as permission is received from the bureaus concerned with this historic area, Carter said. The Octagon was occupied by President James Madison during the War of 1812. The Institute's present headquarters is located behind it, and will be razed to make way for the new structure.

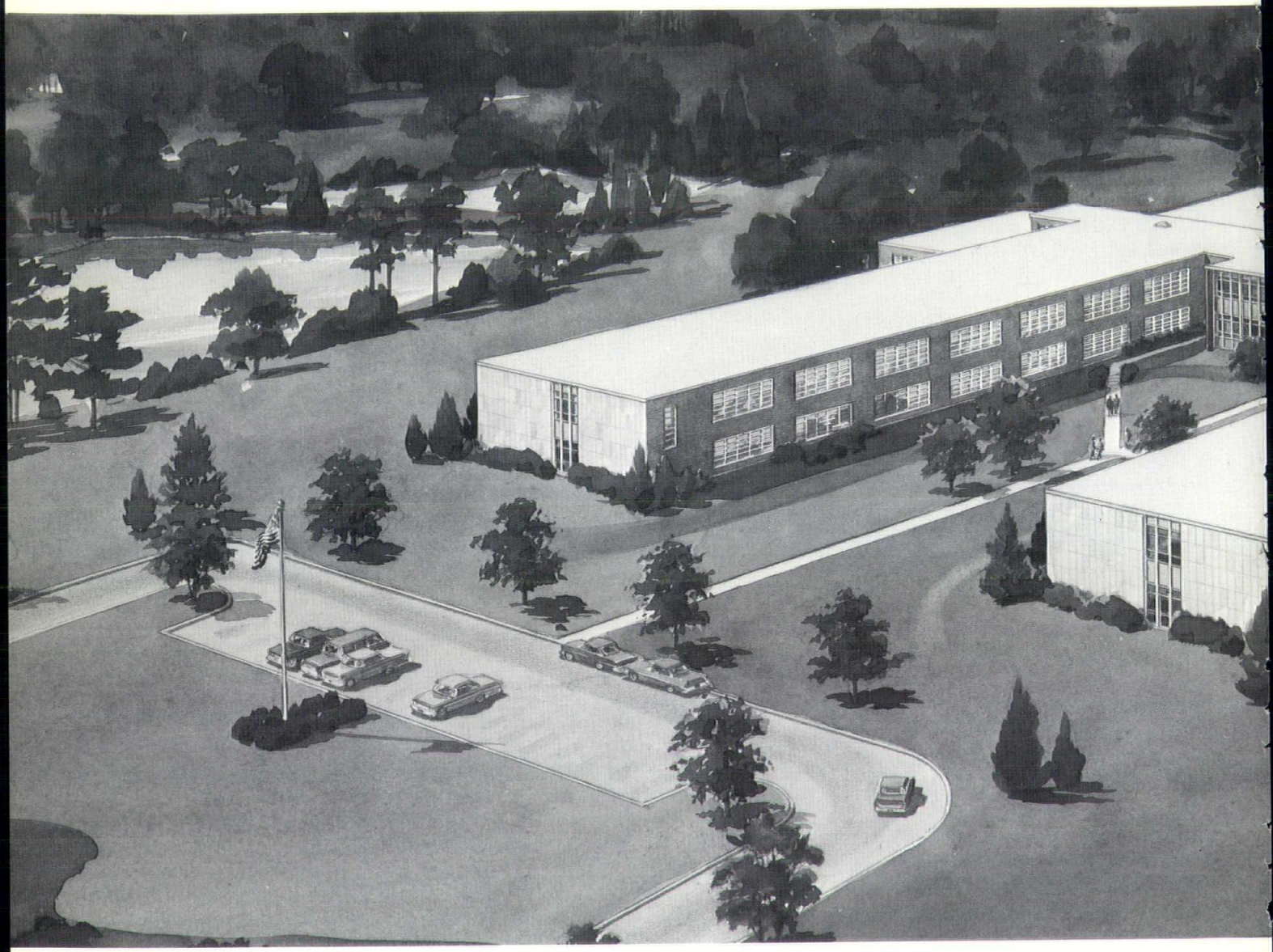
"Twenty-two members contributed," Carter reported. "I was pleased to note the part played by the New Hampshire Chapter."

PLANNING LECTURE

The Currier Gallery of Art, Manchester, will present a lecture "Planning for the Future" on Wednesday, March 6, at 8:15 P.M. The lecturers will be Cary P. Davis, Director of Development and Director of Urban Renewal, City of Manchester; William S. Ballard, President, W. H. Ballard Co., Boston, Real Estate specialist in land use and redevelopment appraisals; and Robert Goodman, Associate Professor of Architecture, Massachusetts Institute of Technology, Cambridge. Open to the public without charge.

(Continued on page 21)

Salem High School

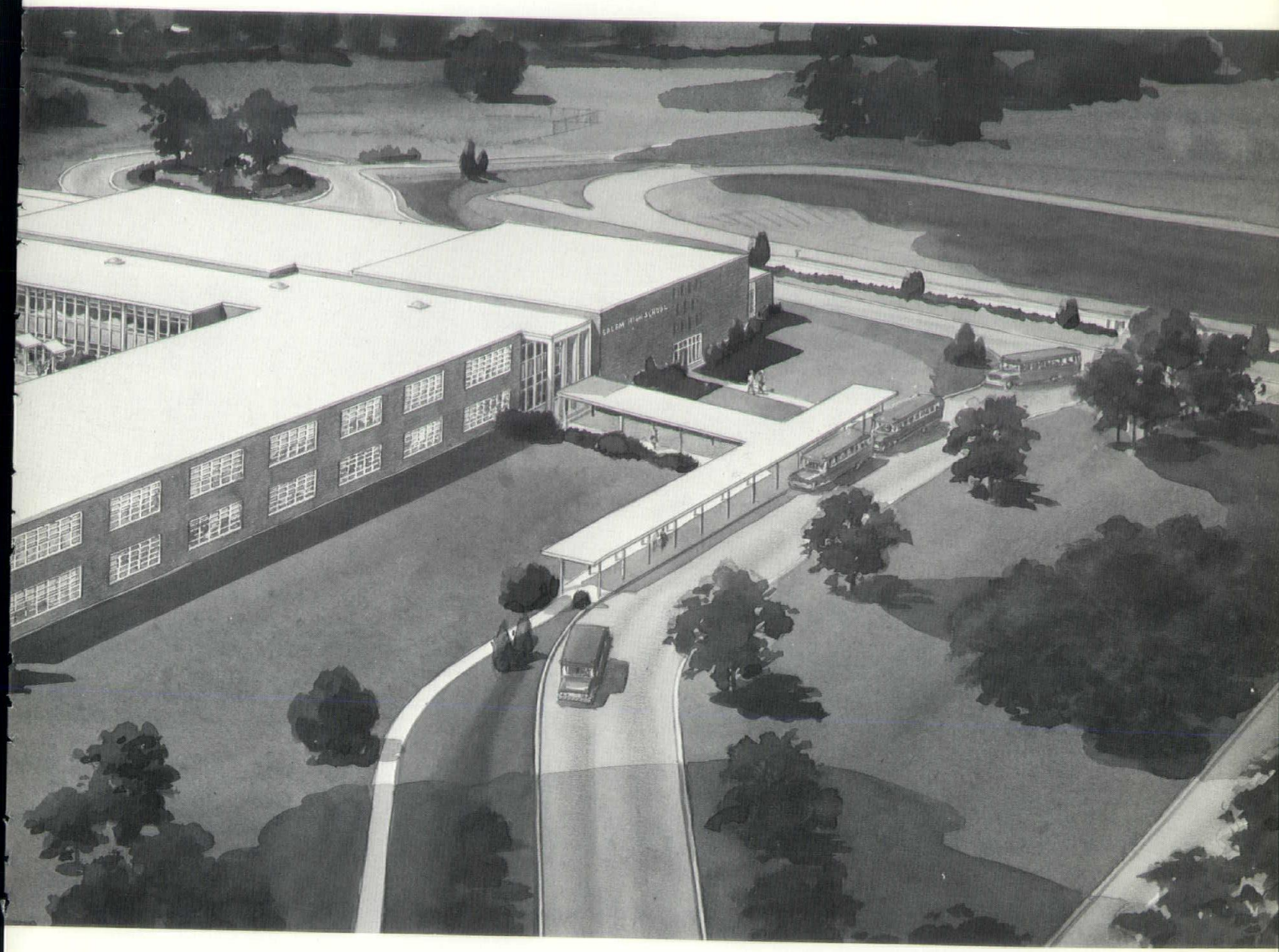


Irving W. Hersey Associates — Architect

Davison Construction Company — Contractor

THE new Salem High School, a facility geared to the varied interests of highly motivated young people, was designed to grow with the complex student community it serves; it is imaginative and flexible, but contradictory and deceiving, too.

The handsome, American black walnut enclosing the administrative offices in the main lobby suggests an indifference to cost and a



"nothing-but-the-best" attitude rarely allowed school administrators, and the terrazzo flooring and ceramic tiles in the immediate area do little to offset this impression.

The hint of unlimited resources persists even out of doors in the vicinity of the athletic fields, despite the fact that priority was given to the classroom, and landscaping expenses were cut whenever it seemed the money could be put to better use inside the two-story building.

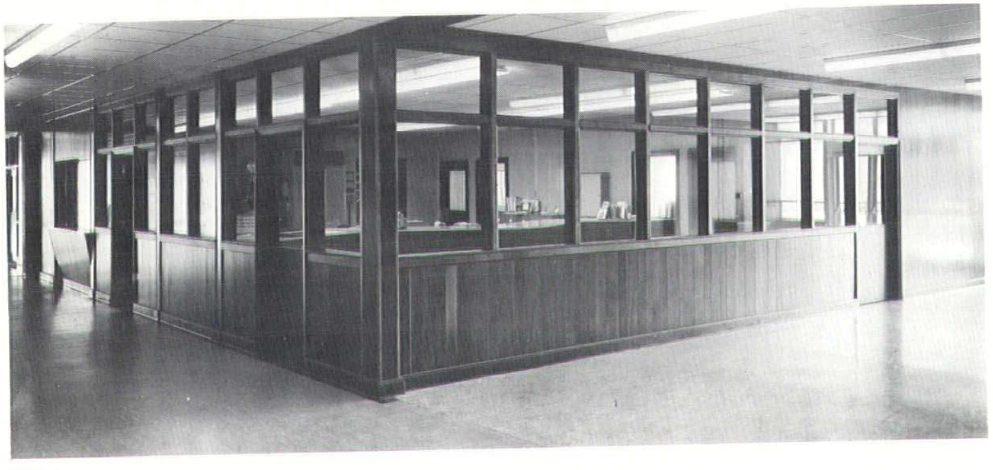
Contrary to appearances, building construction costs did not exceed $12.98 per square foot, or $1,826,307.36. Total cost of the entire project was $2,611,000, or $18.50 per square foot.

Major expenditures cited were $135,753 for access road, sewer lines, ledge removal and clearing the site; $166,964 for finished grading, including all athletic fields and paving; $30,000 for athletic bleachers; $451,975.64 for miscellaneous equipment and fees to consultants and architects.

The track field was installed by Rub-Kor American, Inc., of Waltham, Mass., and it may be the only one of its kind in use at any school in New Hampshire.

"Cinders are no longer as easy to get as they were when the nation's railroads were operating at

(right) Main lobby leading from bus port. At left, opposite telephone and rest rooms, are doors to the auditorium.



Administrative area, sheathed in American black walnut, has excuse desk (canted panel at left) to ease traffic flow and prevent delays on days after widespread absenteeism.

Glazed wall sections resemble aluminum and glass facade in the center, but are milled "knock-out" panels of wood and glass which can be moved if an addition is built across the two wings.

full capacity," Irving Hersey explained. "Consequently, we had to look elsewhere. Compromise with quality was out of the question. We chose the rubber base material."

Rub Kor is a balanced composition of rubber, cork and mineral aggregates which looks like a conventional "hot-top" surface. But there are important differences. The only other New Hampshire school using this kind of a track is the Swanzey High School.

Other innovations include an elevator for the use of physically handicapped children and for the delivery of light freight. The auditorium and administration offices are completely air-conditioned.

Ceramic tiles in all corridors and stairwells contrast boldly with vinyl asbestos and asphalt flooring in most areas. Precast concrete was used for roof decking over the steel frame, and a forced hot water system was installed for heat.

"Complexities of student-teacher relations today demand that we provide flexible facilities for a variety of services and teaching techniques," Hersey added.

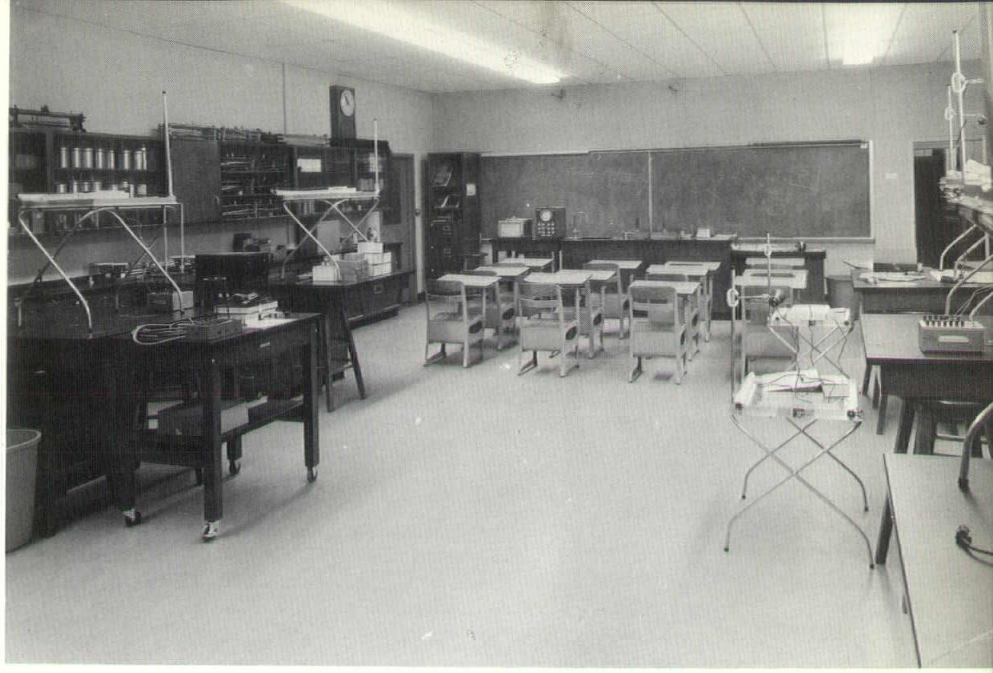
This attitude is reflected at many points. As much forethought went into the installation of the two "excuse desks" on the first and second floors, as was given to the 4,240-square-foot Library Resource Center work room and office, conference room and audio-visual room.

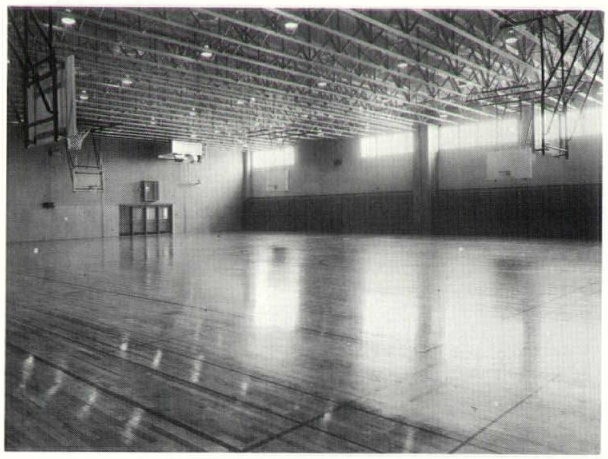
The auditorium, with stage and seating for 700, adjoins a music rehearsal room, two practice rooms and an office. Nearby are the cafeteria and gymnasium, all part of a complex the public can use without interfering with other school activities.

In addition to the auditorium, there are two large group lecture rooms, small group meeting areas and individual study carrels for teachers who wish to prepare a major unit of work, lecture to a large group of students or use a wide assortment of audio-visual tools.

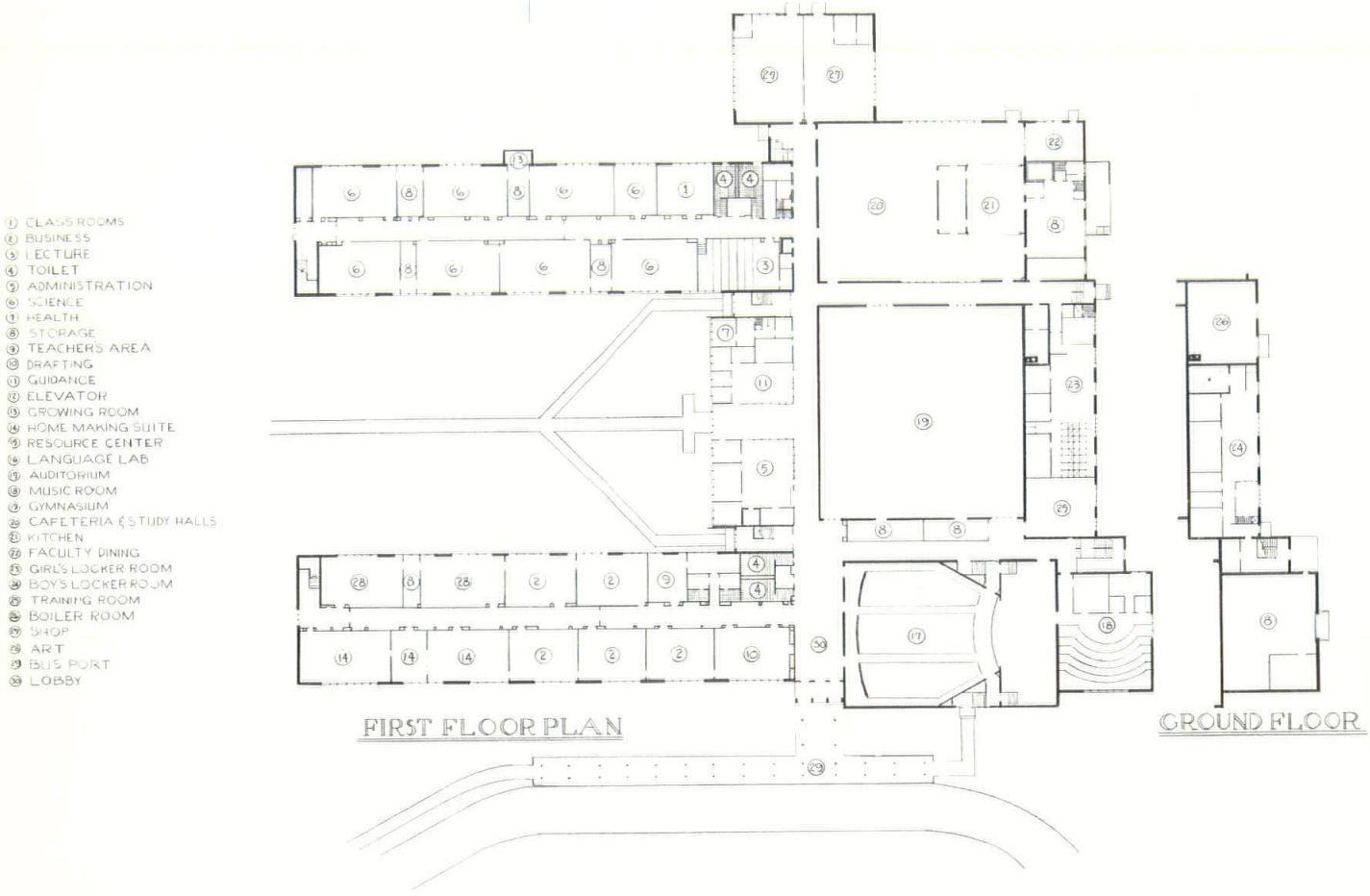
"The intent of the team idea is to present a stimulating approach to an over-view. The students are then divided for review, discussion and evaluation," Hersey said.

The six science classroom-laboratories were designed for a highly





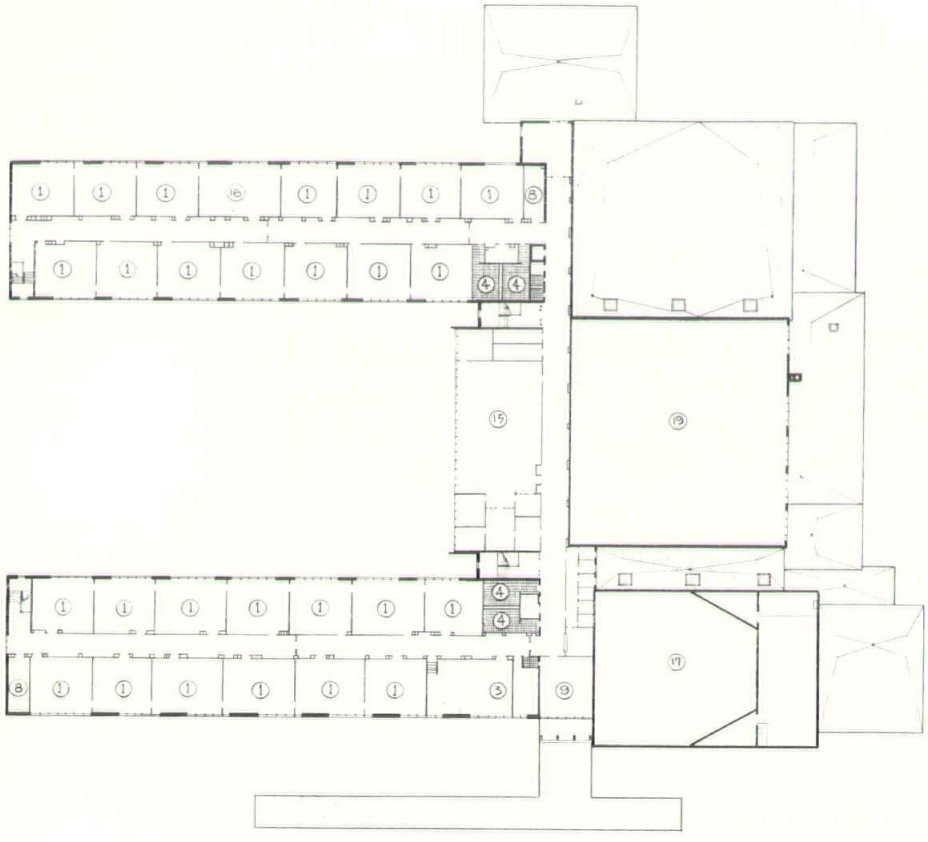
(top) Science room. (above) Gymnasium has folding partitions. (lower) Cafeteria and kitchen can accommodate 2500 students on a three shift basis. Large window overlooks lake at side of building.



① CLASS ROOMS
② BUSINESS
③ LECTURE
④ TOILET
⑤ ADMINISTRATION
⑥ SCIENCE
⑦ HEALTH
⑧ STORAGE
⑨ TEACHERS AREA
⑩ DRAFTING
⑪ GUIDANCE
⑫ ELEVATOR
⑬ GROWING ROOM
⑭ HOME MAKING SUITE
⑮ RESOURCE CENTER
⑯ LANGUAGE LAB
⑰ AUDITORIUM
⑱ MUSIC ROOM
⑲ GYMNASIUM
⑳ CAFETERIA & STUDY HALLS
㉑ KITCHEN
㉒ FACULTY DINING
㉓ GIRL'S LOCKER ROOM
㉔ BOY'S LOCKER ROOM
㉕ TRAINING ROOM
㉖ BOILER ROOM
㉗ SHOP
㉘ ART
㉙ BUS PORT
㉚ LOBBY

Music room adjoins auditorium, seats 100 and can be used as a dressing room during student productions.

The 700 seat auditorium is air-conditioned.



SECOND FLOOR PLAN

advanced and fully equipped science department. Suspended ceiling panels of fire-rated mineral fiber can be removed to permit rewiring, as needed, without any major construction.

There is a small ground floor area housing the boys' locker room, boiler room and storage area. Physical education facilities for boys and girls were located at the rear of the new school to give the students easy access to the athletic fields.

Each of the 27 classrooms is equipped with a school-home telephone setup for the benefit of those unable to attend class but capable of studying at home.

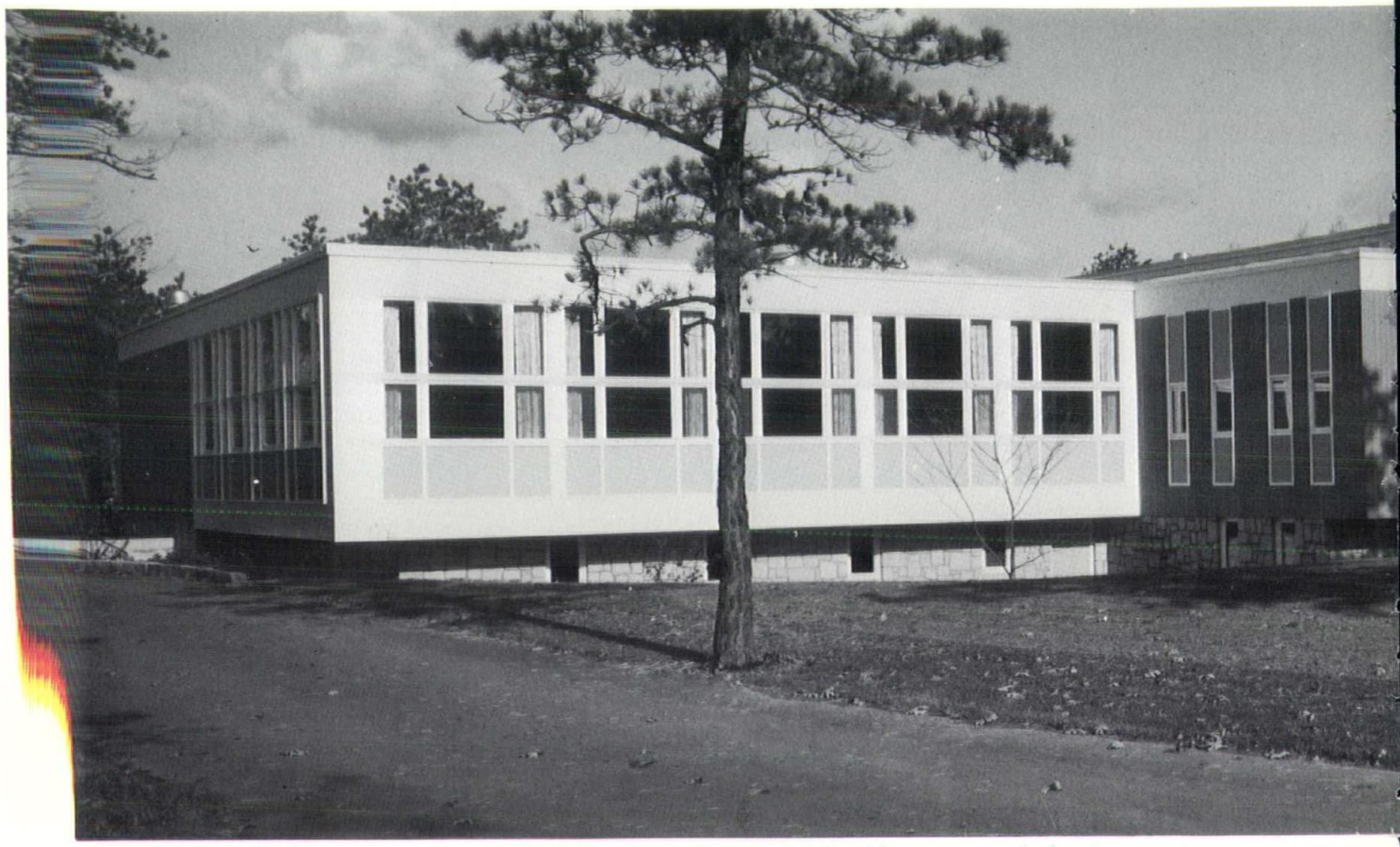
Efforts to anticipate the future needs of the students led also to the use of removable glazed wall sections at the granite-faced ends of the classroom wings. An additional building across these two sections could increase the student capacity from 1400 to 2500.

"Projecting and programming educational resources require very specialized skills," Hersey said. "We were assisted in this area by Francis G. Cornell, president of Educational Research Services, Inc., of White Plains, N.Y."

In an apt summation, the architect noted, "The impact of the new facility centers on the flexibility provided for the instructor and the possible expansion of course offerings. These opportunities should foster student interest in education, self-examination and academic growth."

Science room.

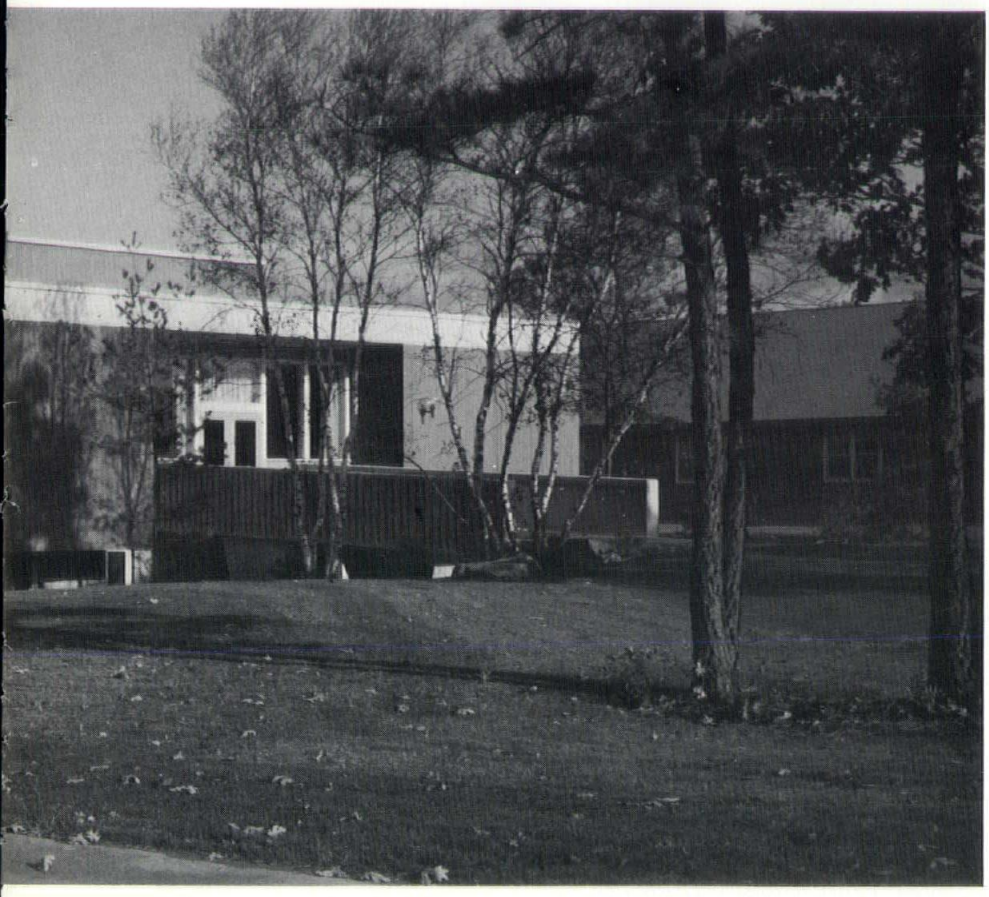
HAVE



Administration building, in the heart of the congregate area, is linked by enclosed breezeway to Lodge Apartments which are built around a series of landscaped courts.

United Church of Christ Retirement Community

NWOOD



THERE is very little about the immediate appearance of Havenwood in Concord, N.H. to indicate that it was planned specifically to house elderly, retired people.

"When we were asked to design and build the community, the words 'retired' and 'elderly' were purposely played down," said architect Guy Wilson. "Our primary goal was to produce facilities that would afford people — regardless of age — an opportunity to communicate and socialize in pleasant surroundings, to develop their individual talents, and to continue to experience a creative life."

The resulting complex of buildings reflects a choice between 'independent' and 'congregate' living.

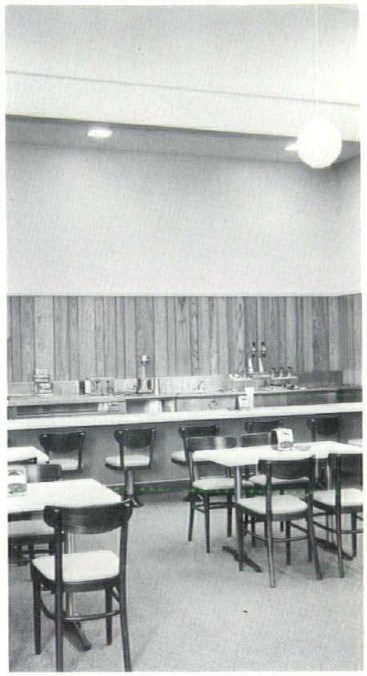
The first step was the selection of the eight-acre site at Christian Avenue and Hazen Drive in a residential area that had not been 'overbuilt.'

"The position of this site in relation to the overall city plan, existing traffic patterns, and available city services made it desirable, along with good natural drainage. The real bonus was the existence of numerous trees that could be preserved for natural landscaping," Mr. Wilson noted. "The $1.5 million

Guy K. C. Wilson — Architect

Arthur O. Lawson — Builder

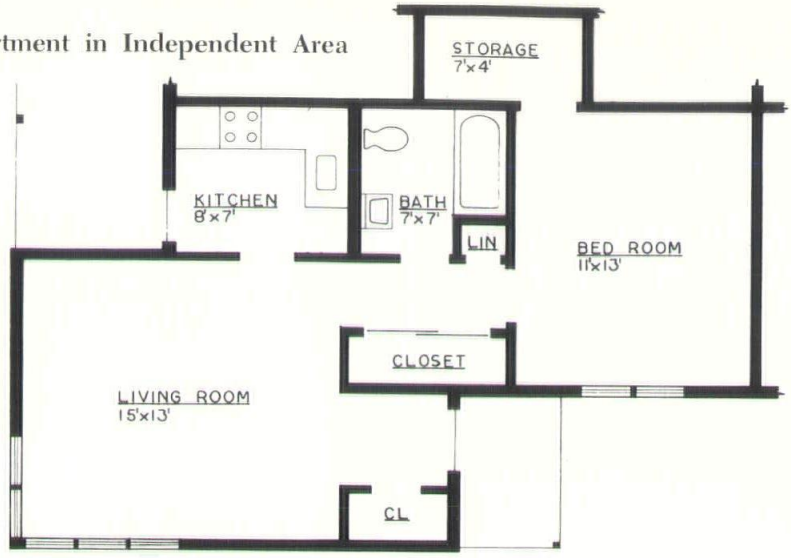
Small concrete bridge leading to main entrance of Administration Building spans area excavated to add interest to site and to permit sun's rays to brighten activity rooms.

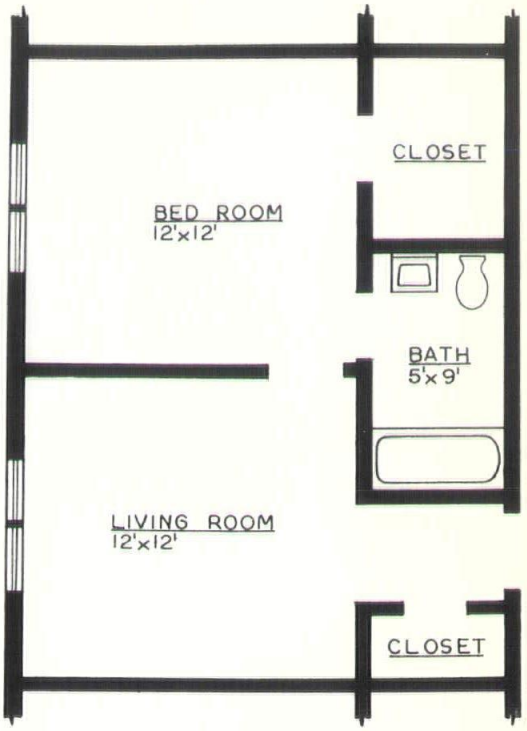


(above) Upper wall sections were designed to admit clear light into lobby of the Administration Building and coffee shop behind partition on the other side of stairway. (right) Coffee shop and dining room for 'congregate' tenants in Lodge Apartments.

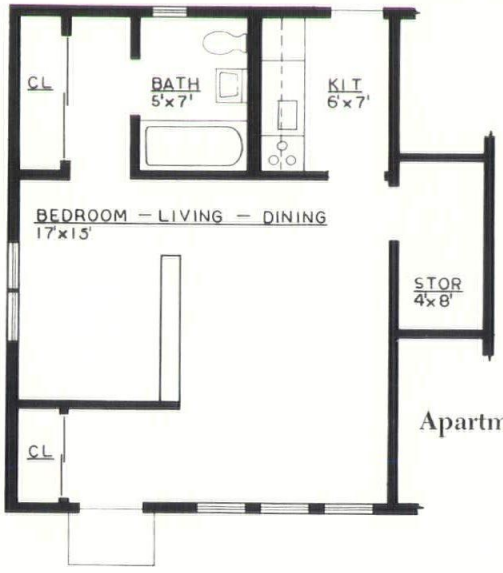
(left) Meals for approximately 200 persons can be prepared in the kitchen. (above) Group living room is used by occupants of Lodge Apartments in the immediate area.

Apartment in Independent Area

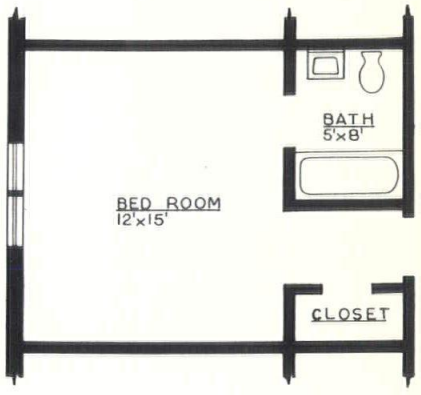




Lodge Apartment

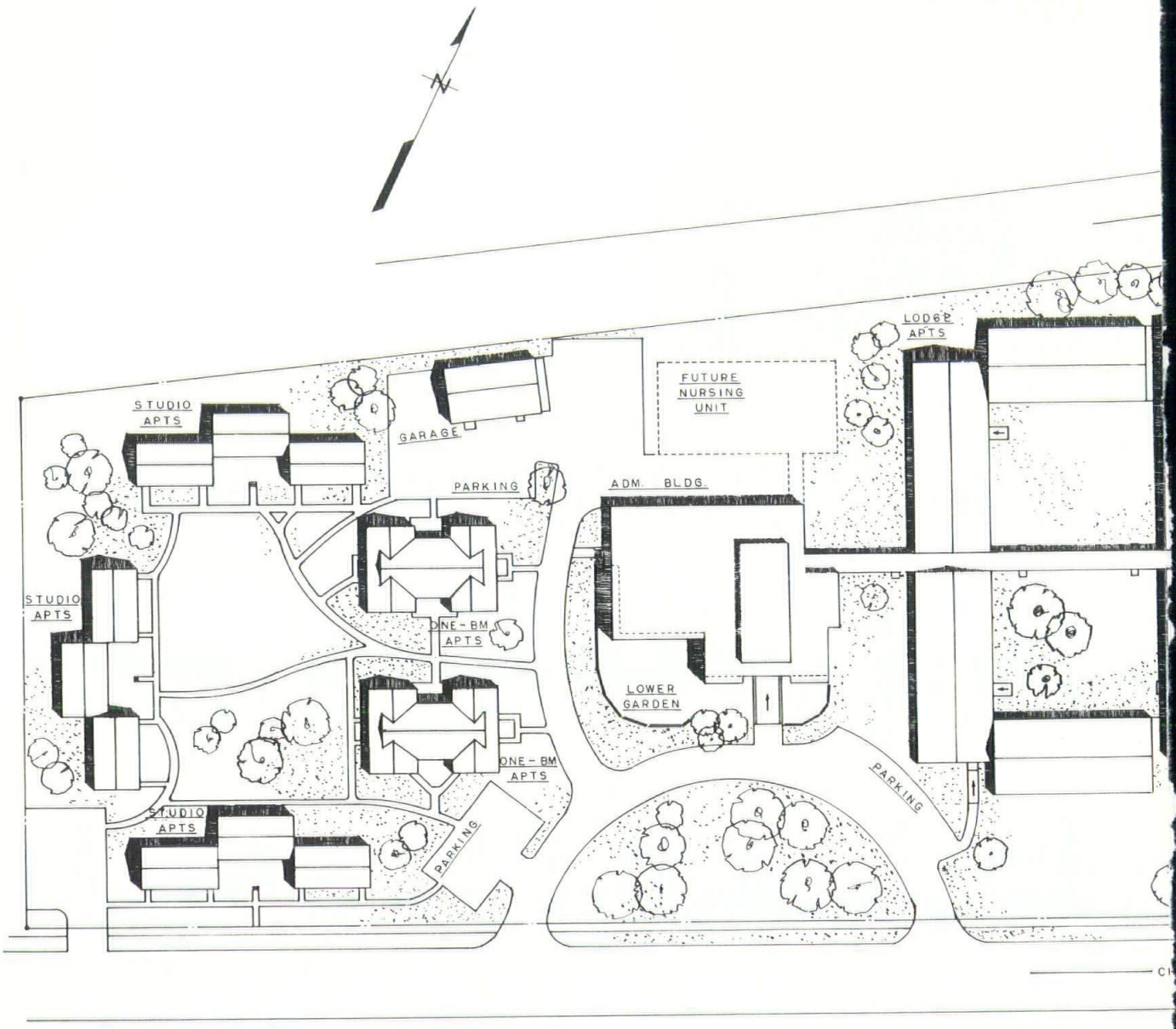


Apartment in Independent Area



Lodge Apartment

Apartments with kitchen or housekeeping facilities are housed in trim, comfortable wooden clapboard buildings in one of two "independent" areas. These units also include storage rooms for seasonal equipment such as lawn furniture and gardening tools.



Site Plan

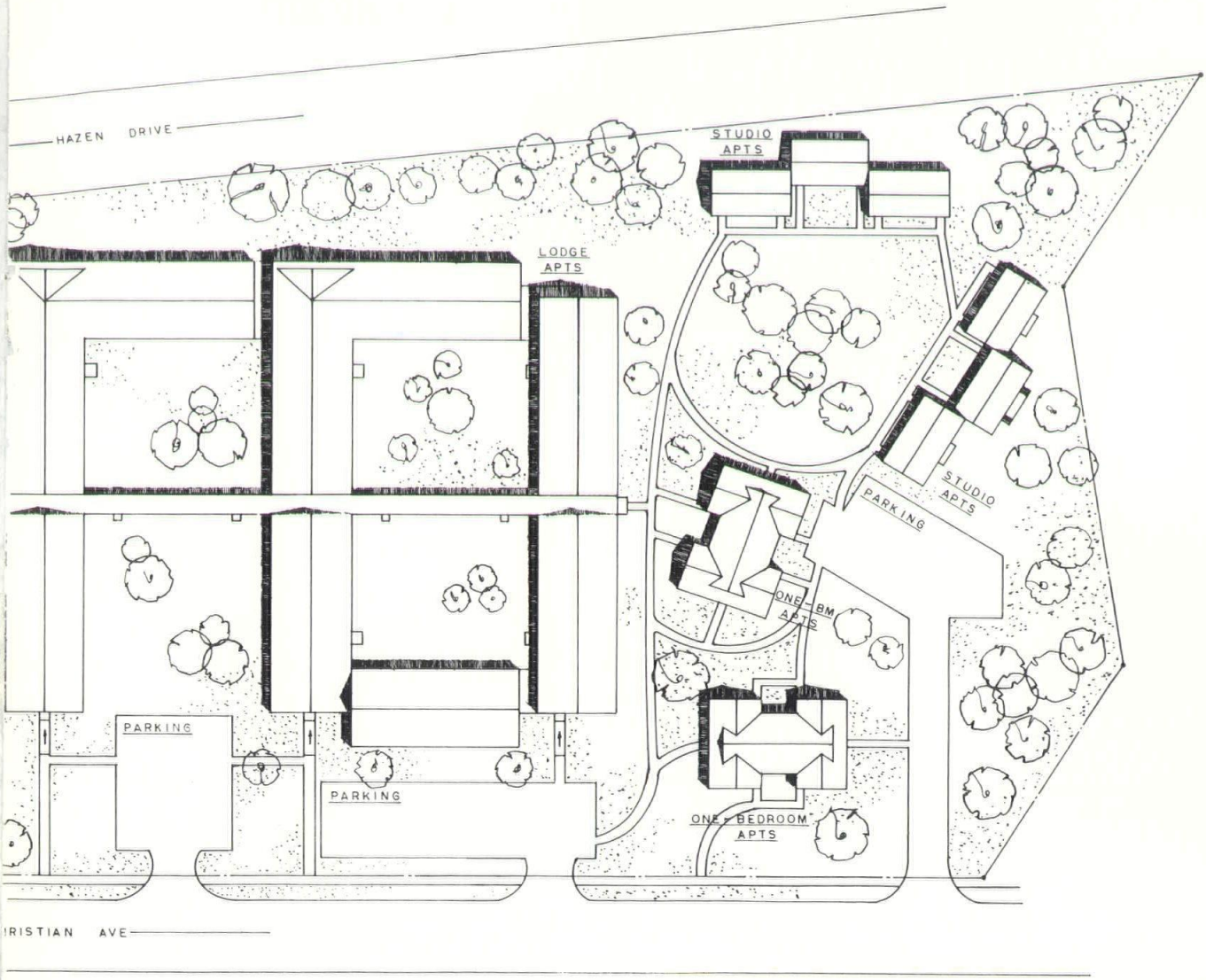
cost of the project included the development of the site, but not its purchase price."

The largest structure is the Administration Building, situated in the heart of the congregate area. Attached to this building by an enclosed breezeway are the Lodge Apartments, built around a series of landscaped courts. These apartments are primarily single rooms with baths but some do include a separate bedroom.

Each tenant in a Lodge Apartment has access to a group living room shared by others in the immediate area, regardless of whether his own apartment has a living room. Rent for these units includes food, which is prepared in the kitchen of the Administration Building and served on the main floor. Some 200 persons can be served here.

Flanking the congregate area, are two tree-shaded sections and clusters of small buildings housing the larger Independent Apartments with kitchen and housekeeping facilities. These tenants have use, also, of the Administration Building and the half dozen activity rooms in the lower section, including the beauty shop, barber shop, laundry, sewing room and woodworking shop.

"From the very start, cost was uppermost," Mr. Wilson recalled. "Every nickel had to be very carefully considered. Dr. Everett T. Barrows,



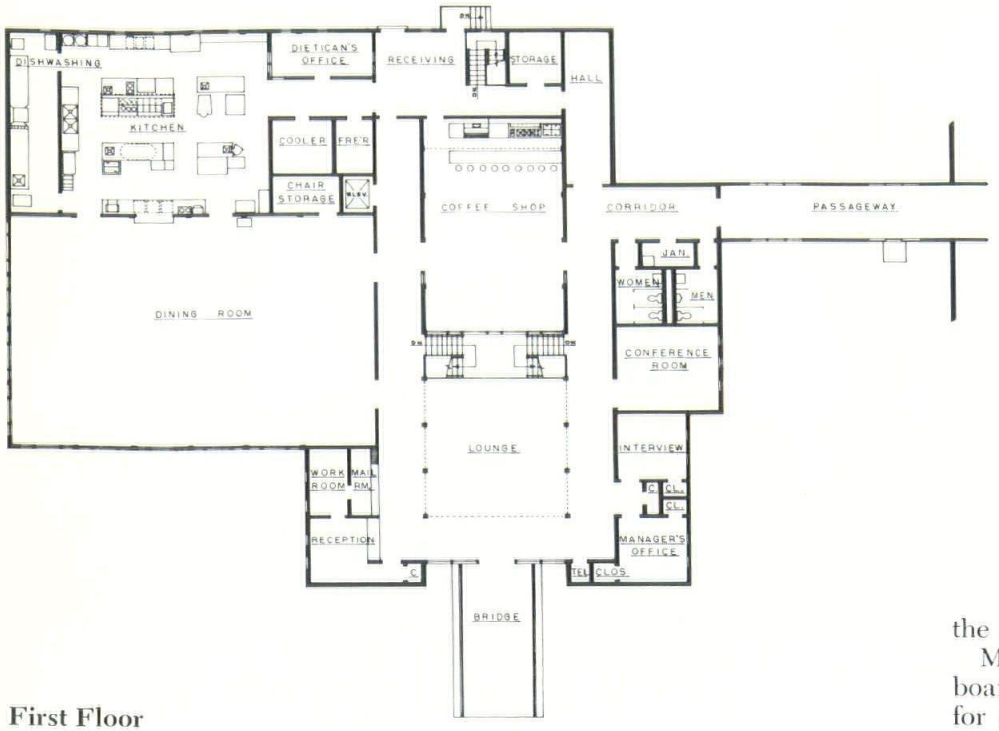
who is Minister of the N.H. Conference of the Church of Christ, carried on detailed negotiations with builder, Arthur O. Lawson, of Contoocook, and with suppliers and subcontractors."

Havenwood, however, is not restricted to members of any particular religious faith, despite the fact that it was conceived and built as the United Church of Christ Retirement Community, Inc.

There are 170 units, which can house 250 persons. All buildings are heated electrically, and there are individual thermostic controls in each one of the 220 rooms.

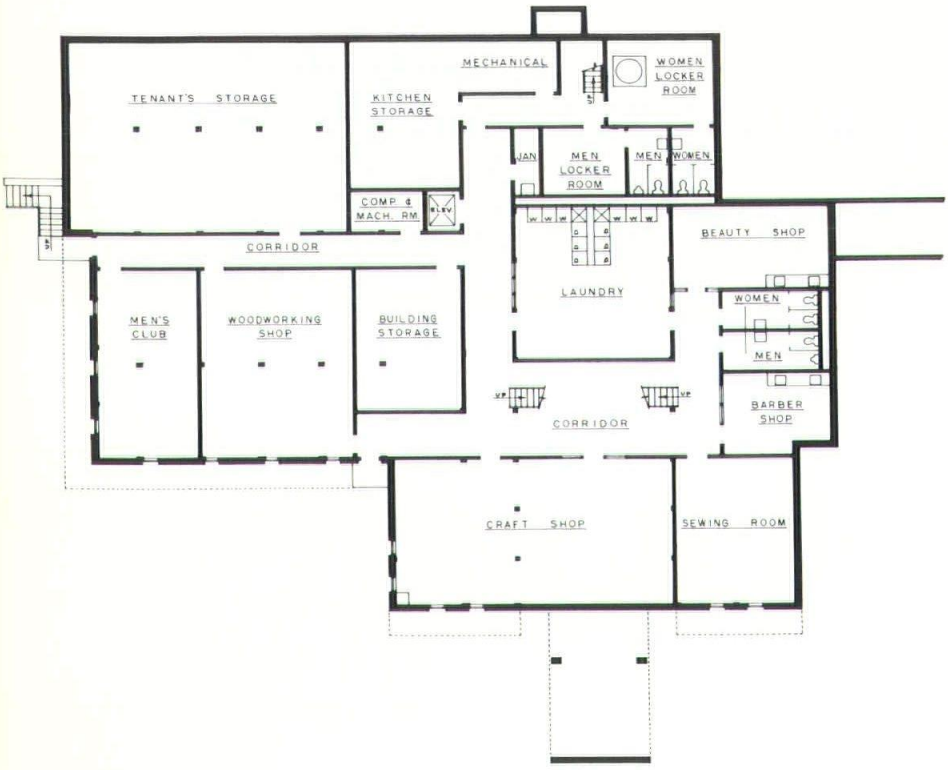
Ten per cent of the bathrooms were designed to accommodate wheelchairs, and there are several places where ramps serve in place of steps. In addition, each bathroom and living room is equipped with an emergency alarm button, and each shower/tub area boasts a safety handrail. But there is nothing else to suggest any preoccupation with the age or state of health of residents of Havenwood.

All buildings are of wood frame construction. Concrete was used in each foundation, as well as for the small bridge leading to the main entrance of the Administration Building. The lower part of this building and ends of the Lodge Buildings were faced with granite veneer. Slabs of granite form the retaining wall, and granite walkways traverse



First Floor

Administration Building Floor Plans



First Floor

Ground Floor Ground Floor

the lower garden.

Most siding is of wooden clapboard. Asphalt shingles were used for roofing, except at the Administration Building, which was sheathed in vertical pine boarding and covered by a flat roof of built-up tar and gravel.

Inside apartment walls are of fire-rated sheetrock. Acoustical ceiling tiles are found in the Administration Building, while the apartments have painted sheetrock ceilings.

The University of New Hampshire has already documented on film the community that is Havenwood — the first of its kind in the State.

"Tenants started moving in last May," Mr. Wilson said. "Somehow we managed to stay right on schedule, despite many problems and our determination to keep costs low."

A portion of the site has been set aside for a nursing home, which will be built this summer. In the meantime, the people responsible for Havenwood have been encouraged by the reactions of tenants and visitors indicating that their plans were well laid, that people's needs are being met and that the members of this community have indeed found a congenial atmosphere for constructive living.

Havenwood also received the approval of Mr. Wilson's fellow architects. The project was awarded a Design Commendation by the N. H. Chapter of the AIA at its convention in November 1967.

(Continued from page 7)

NEW ENGLAND REGIONAL STUDY CONTRACTS AWARDED

The New England Regional Commission has announced that contracts totaling $355,000 had been signed with five research consultant firms to assist the Commission in drawing up a regional action development program for New England.

In the preparation of the Commission's Comprehensive Economic Plan, which is designed to provide both a base of economic data and analysis of critical problem areas, Arthur D. Little, Inc., of Cambridge, Massachusetts, will compile the Economic Overview for $95,000; Robert R. Nathan Associates of Washington, D.C. will prepare the Human Resources, Tourism and Marine Industries Studies for $65,000; and New England Economic Research Foundation of Boston will do the Urbanization and Foreign Trade Studies for $50,000.

These studies, taken together, will help identify New England's portion of the Nation's economy today, spell out the current economic trends in the region, identify those factors which cause changes in the area's economy, and highlight sub-regional differences.

The Commission awarded its Transportation Study to Systems Analysis & Research Corporation of Cambridge, Massachusetts, for $75,000. This study is intended to provide the Commission with basic information needed to determine the most beneficial transportation improvements essential to the region in addition to the regular State and Federal programs, and to develop a program of specific transportation facilities essential to the economic development goals of New England.

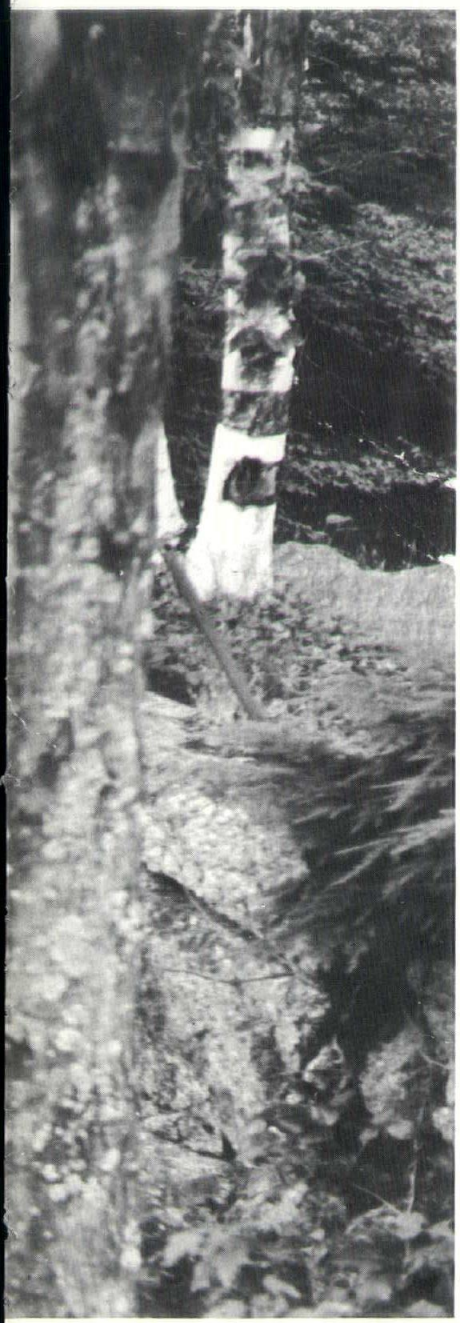
The Commission's Water and Air Pollution Study went to Charles River Associates, Incorporated, of Cambridge, Massachusets, for $70,000. This study is expected to provide the Commission with information which will permit it to (1) consider environmental management measures which are appropriate supplements to existing State and Federal programs; (2) appraise

(Continued on page 24)

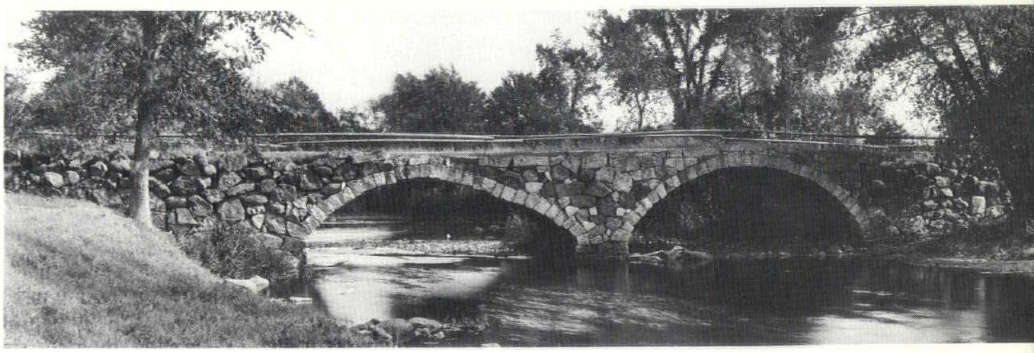
Stone Arch Bridges of Hillsboro

Photographs By The Rev. Raymond E. Gibson

ARCHITECTURAL engineers from another era produced some of New Hampshire's most aesthetically pleasing yet least appreciated structures: stone arch bridges. (A state-wide coverage of such bridges, written by Richard F. Upton, appeared in GRANITE STATE ARCHITECT Jan.-Feb. '66.) A preponderance of these landmarks was built about 1830-60 in the Contoocook river valley. Prior to that time, spring freshets had repeatedly washed out the wooden ones and the local residents sought a more enduring type of construction. Many of these early settlers were of Scotch-Irish descent and were reported to be the best stone masons of the period. The combination of need plus the availability of specialized knowledge produced a great variety, especially on Hillsboro's Beard Brook, a tributary of the Contoocook. These photographs illustrate some of the many forms of dry mortar construction used by the early artisans.



Massive, yet compact, bridge spans Beard Brook where it divides and flows around a small island.



Mortar and stone railings were later added to this bridge over the Contoocook river. (photo by Manahan, courtesy of Phelps Photo.)

(above) No longer in use, this two-span bridge has become a roadside park and picnic area complete with a descriptive historical marker. (right) Built in 1840 and named for its builder, Capt. Jonathan Carr, this double arch structure is one of the most interesting and largely unspoiled bridges remaining.

(Continued on page 21)

and measure as quantitatively as possible the necessary regional expenditures of environmental pollution control measures; and (3) outline an action plan.

All the studies are expected to be completed by this June.

DODGE REPORT ON CONSTRUCTION

December 1967 contract values for future construction totaled $3,996,197,000, it was announced recently by the F.W. Dodge Company, leading analyst of construction activity and a division of McGraw-Hill, Inc.

The seasonally-adjusted Dodge index of total construction contract value for December was 166, down slightly from November's 168. The final 1967 month's contract values represented a 25 per cent increase over the December 1966 total, when construction was curtailed sharply by scarce credit.

"Contract values for 1967 construction projects climbed to $52,895,006,000, five per cent higher than the $50,150,085,000 registered for 1966," reported George A. Christie, chief economist of the F.W. Dodge Company.

"The uninterrupted strong expansion during the past year has put the construction industry back on trend after its 1966 recession," Christie explained. "But, with recovery just barely complete," he cautioned, "there's been a distinct leveling-off in the Dodge Index, which may be a signal of some difficult months ahead. Two familiar problems — costly credit and cutbacks of public funds — are once more threatening to squeeze construction markets."

Strong gains in most major categories boosted the non-residential building total to $1,550,311,000 in December, a full 14 per cent above the year-ago amount.

A number of contracts for large office buildings and manufacturing plants pushed the commercial and manufacturing categories up an identical 17 per cent during the month. Schools, hospitals and the social and recreational categories also posted large gains, while public buildings and miscellaneous nonresidential contract values dipped slightly below the December 1966 figures.

December contracts for residential building registered a sharp 55 per cent gain over the credit-starved closing month of 1966. The December 1967 total of $1,403,529,000, brought large increases in both apartment and single-family contract values, and a huge 61 per cent gain in the nonhousekeeping (hotel-motel-dormitory) component.

December's seasonally-adjusted index of residential contract value slipped six per cent from November's peak rate, however. Little change is anticipated in the rate of housing activity over the next several months, Christie said.

NONBUILDING PROJECTS CONTINUE STRONG

Significant gains in contracts for streets and highways, sewer and water facilities and miscellaneous nonbuilding construction brought a healthy increase in the nonbuilding category. At $1,042,357,000, the value of December nonbuilding contracts was 12 per cent above the 1966 amount. Utilities declined 17 per cent for the month, despite a $134 million contract for an electrical power plant in Pennsylvania.

TOTAL 1967 CONSTRUCTION CONTRACTS UP FIVE PERCENT

"Contract value for 1967 construction projects ended the year five per cent ahead of the 1966 amount," the Dodge economist reported.

The past year's totals were divided among the three major categories of construction in the following manner: nonresidential building up four per cent; residential building up 10 per cent: nonbuilding construction up two per cent.

A summary of the latest month's construction contract figures follows:

MONTHLY SUMMARY OF CONSTRUCTION ACTIVITY
Prepared by F. W. Dodge Co.,

	Dec., 1967 (000)	Dec., 1966 (000)	% Change
Nonresidential Building	$ 1,550,311	$ 1,358,371	+14%
Residential Building	1,403,529	903,245	+55
Nonbuilding Construction	1,042,357	927,669	+12
Total Construction	$ 3,996,197	$ 3,189,285	+25%
	12 mos., 1967 (000)	12 mos., 1966 (000)	% Change
Nonresidential Building	$20,138,860	$19,393,085	+ 4%
Residential Building	19,535,920	17,827,380	+10
Nonbuilding Construction	13,220,226	12,929,620	+ 2
Total Construction	$52,895,006	$50,150,085	+5%

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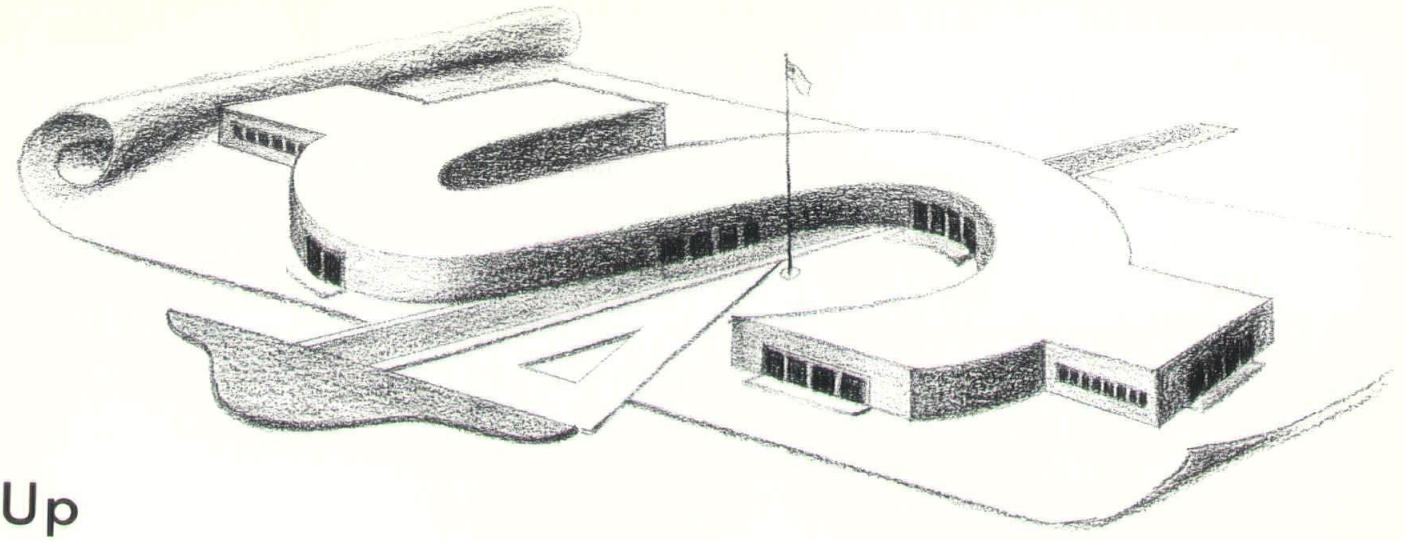

Up The Down Escalator?

The following discourse on school construction was delivered before a seminar sponsored by members of the Producers' Council by Frank V. Carioti and reprinted through the courtesy of "Northwest Architect." Mr. Carioti's remarks are particularly pertinent to New Hampshire's growing problem in providing progressive and proper educational environments.

The subject is *new ideas for school construction.* I would estimate that right now there are more than 2,000 teams of architects and school planners across the nation working on the drawings for new schools and additions that will be added to our national inventory in 1968. Still others are already projecting very specific plans for the future.

These architects and educators are planning for the program of education in the United States — *education* as the *primary key to growth and survival of the individual and the nation; education* that will determine the long-range future of our lives, our children's lives, their children's lives and so on to infinity. The planning being done today must support and advance that educational program with structures to serve for the next fifty or one hundred years.

We have accumulated an estimated 140,000 school plants in our educational system. There is a good deal of justifiable excitement over the handful of high quality schools designed for advanced teaching programs and spotted across the country by the far-sighted educator and the creative architect but, out of the inventory of 140,000, how many of these excellent schools can we point out? Would the list total even 50? . . . 100? . . . 200? At best, it's not a very good batting average.

Before I am automatically lumped with the predictors of doom who suggest that all is black in the U. S. education scene, may I clarify the record immediately. I don't wish my comment misunderstood or misquoted as destructive criticism of an educational program I view with considerable respect and even, at times, delighted amazement.

I hold it indisputable that the United States has built what is today the finest and broadest program for mass education the world has ever known. Here and now more of the basic human benefits of education are being made available to more people for a greater common good than in any place or at any time in history.

What our educational system *is* and *what it does* should be a matter of national pride but we can't afford to be unduly smug. Let us admit that many of our advances have hinged on the grace of a cultural climate which has always given a degree of priority to education.

If we measure our system on the basis of what our educational program and its facilities *might be* and *could be* — and *must be* if we are to grow in a world society — well, that evaluation is another story. We are capable of implementing a program infinitely beyond our current standards. We are likewise capable of providing school buildings much better than have come off the drawing boards to this date.

Since "education," which is a *process,* and "school," which is a *place,* are so interlaced in this discussion a few definitions are pertinent.

In brief, the *process* of education suggests that, by a variety of means, a student is encouraged in his quest for knowledge — encouraged and led by his parents by professional guidance of a person called a teacher, . . . through personal experiences, through vicarious experiences drawn to his attention in books, on television, in films, through basic training in the fundamental rules which have governed our actions in the past. In the process of education the student hears, he sees, he smells, he feels, he watches and he does, he comes to know and he assumes, he responds, . . . and thus he learns.

We assume that the normal student, born with a native capability to respond and learn, will become educated most successfully when given the greatest incentive to learn and the greatest exposure to the treasure chest of world knowledge.

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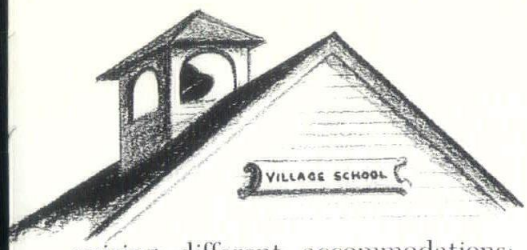
You can see that even this "simple" definition opens the door to debate. From this point on we may get caught in the crosswinds of the professional educator's storm, trying to determine what education is and who does what to whom to make it happen. I would like to sidestep that storm right now. The immediate and more specific question still stands as to what impact the physical facilities we plan may have on the success of *whatever* programs the educationists may follow.

Now to the second definition: We are reviewing new ideas in school construction — what is a *school?* In the broadest sense of his total experience the whole world is a gigantic learning laboratory to the student. He learns at home, at every turn of the city streets, in the stores and museums, in the open fields of the country, at the beach and in the air. In the physical sense we refer to a school as a *place*, a place which may have *a* building, or several buildings or no building at all, a *place* for assembling students, teachers and equipment for instruction and study but always a *place* to which a student goes for inspiration and guidance.

The building is not in itself the school; the building is, or should be, an expression of what the educational program is attempting to accomplish for the student. You will recognize in that statement a paraphrase of Louis Sullivan's credo, "form follows function" and in this modern day many professionals will offer a variation on the Sullivan theme until it reads, "form *allows* function," which has been the noble cry of the dedicated designer and architect for the past two decades. However, the bold phrase is more easily and more often spoken than put into practice. If this were not true, how could we account for the mass of the so-called "new" school buildings constructed within the last 20 years, buildings that too often mar the landscape, function with less efficiency and amenity than most new factories and abuse our senses of taste, value and appropriateness?

The school is the most often repeated building type in the country. What has its general character been to date? What would we learn if we were able to visit these 140,000 facilities we own and operate? Rather than give you my personal comments right here, may I quote from a survey made in the northeastern states and Michigan by an outstanding authority on school architecture:

"Go where he would, in city or country, he encountered the district school house, standing in disgraceful contrast with every other structure designed for public or domestic use. Its location, construction, furniture and arrangements seemed intended to hinder and not promote, to defeat and not to perfect, the work which was to be carried on within and without its walls. The attention of parents and school officers was early and earnestly called to the close connection between a good school house and a good school and to the great principle that to make an edifice good for school purposes it should be built for children at school and their teachers; for children differing in age, sex, size and studies and therefore re-



quiring different accommodations; for children engaged sometimes in study and sometimes in recitation; for children whose health and success in study require that they shall be frequently, and every day, in the open air for exercise and recreation and at all times be supplied with pure air to breathe; for children who are to occupy it in the hot days of summer and the cold days of winter and to occupy it for periods of time in different parts of the day in positions which become wearisome if the seats are not in all respects comfortable; for children whose manners and morals, whose habits of order, cleanliness, and punctuality, whose temper, love of study and of the school are in no inconsiderable degree affected by the attractive or repulsive location and appearance, and the internal construction of the place where they spend or should spend a large part of the most impressible period of their lives."

As I noted before quoting the report, the subject schools were in nine northeastern states and Michigan. During the course of a special study assigned to be my Educational Facilities Laboratories in 1962 and 1963 I visited 43 school districts in 20 states, spread over a good portion of the rest of the country. The general evaluation of the new and old schools I saw would parallel the comments of the quoted report.

What is most embarrassing is that the "Report on Schoolhouses" which I quoted was first published by Dr. Henry B. Barnard, Superintendent of Common Schools in Connecticut, in the year 1841. You will undoubtedly share my frustration in the fact that 124 years later we are still making the same mistakes.

We can actually say we are making bigger mistakes. The one-room and two-room rural school building of Dr. Barnard's day has grown to single buildings or complexes of buildings to house as many as 6,000 high school students at a sitting. The intimate ivy-clad college has been crowded out by sprawling universities which are in themselves the size of a small city, and must face all the problems of the city administration regarding housing, feeding, traffic controls, medical services, etc. Today we are serving more than 53,000,000 students in our total program and we employ more than 2,000,000 teachers.

Our school buildings seem to have been planned by some remote authority, following a directory of minimal code standards for safety and health but oblivious to the functional demands of a truly enervating, eight-hour day job of teaching and learning. You have walked through this school many times. The reverberant corridors are lined with poorly lighted lockers, or the walls are surfaced to a clinical shine which the maintenance people report can be scrubbed down easily. Outlets are generously scattered about the corridor to accommodate the electrical needs of the floor scrubbing

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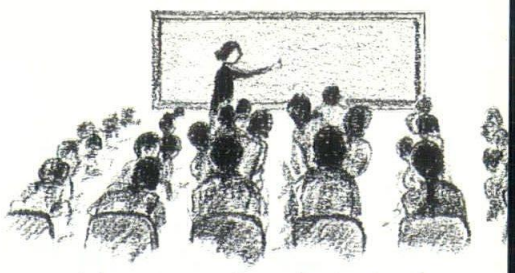
and polishing equipment but in the classroom outlets are hard to come by and there is hardly a place (or the right place) to plug in the new projector given the school by the local PTA (the second projector for this school of 900 students). No matter, we couldn't use the projector in this room anyway, since there are no facilities to darken the room and the sunlight slashes across the chalkboard from 1:30 to 3:00 o'clock.

Lots of windows and thank goodness for them on the warm days of spring, early summer, late summer and early fall when school is in regular session (can't use this building for summer courses — the heat is unbearable). Of course, a lot of noise, dirt and drafts come in the windows with the fresh air — but how else would you breathe with 45 students occupying a room planned for 30? The poorly illuminated chalkboard is located within reach of the teacher — to a maximum height of 85 inches off the floor — in spite of the fact that there



are eight rows of students in the narrow room and the last four rows couldn't possilby get a decent view of the chalk message unless they suddenly developed X-ray vision to see through the students in front of them. No matter, the kids in back are always the slow students anyway . . . and so the travelogue goes.

Of all the things that happen within the school walls, *seeing* and *hearing* are the most critical, both from the point of the teacher and the student. *Thermal control* ranks very close in critical importance and the *aesthetics of environment* for controlling or directing the emotional and psychological response of the human beings involved are a primary consideration. A majority of the errors in the funtional planning of school spaces are made in these areas.

When it comes to our school we seem to have forgotten that almost one-half of human energy is reportedly expended in the motor task of seeing, hearing and adapting to thermal conditions under even the most favorable circumstances. It is logical to conclude, then, that if these functional conditions within a school are less than favorable a student will spend so much physical energy in adapting to poor conditions that very little energy will be left for the task of learning. A teacher also expends an enoromous amount of time and energy simply trying to communicate in a poorly designed environment.

Measurable facts about human response to working conditions have been collated through extensive research and applied to the planning of industrial plants, offices and homes for more than 30 years. Any administrator or architect who did not take these findings into account when planning a *commercial* space would be considered by his colleagues to be either incompetent or a first rate boob. The history of our school building program, then,

suggests that we assume a *student* is a creaure set aside from the human race. We continue to build structures that do more to get in his way than to aid him in the learning task.

Our basic errors are costing us dearly in both human efficiency and the loss of results we seek from our educational program. If shortcuts to functional planning are taken in the name of cost savings the method of cost evaluation is spurious at best. Let me provide a specific example, in this case referring to planning of the lighting to be used in the school.

Estimates indicate that between 10 and 12 per cent of our educational dollar goes into capital investment, the cost of buildings and fixed equipment. Taken as a percentage of our total investment the difference between an excellent lighting installation and a standard or poor lighting installation might run to a comparatively small portion of our cash outlay (perhaps one one-hundredth of one per cent of our total dollar) even though it appears as thousands of dollars in a multi-million dollar building program. But when a teacher is communicating with a student, displaying a map or written message on a poorly lighted sidewall, the absence of properly designed and installed chalkboard lighting may easily reduce the efficiency of this communication fifty per cent or more below its full potential. To bring that teacher into the classroom we annually invest between seventy and eighty per cent of our dollar spent on education — and yet we foolishly allow fifty per cent of *that* major investment to slip through our hands because we were trying to cut corners and save one-hundredth of one per cent when the building was originally planned.

Even on the grounds of economics alone this type of budgeting does not make sense. The example could be extended in many areas. Slowly but surely we are breaking down misconceptions of the public as to what constitutes a frill and what is a necessity in the new schoolhouse. A great deal of public relations work must still be done by both administrators and architects in these areas to at least clarify the errors made by our predecessors, much less move on to advanced standards.

Air conditioning used to be a dirty word in school planning — and still is in some areas. Yet we know that the student and teacher, like a laborer, a secretary or housewife, will work more efficiently and with less distractions in a thermal environment balanced to creature comfort. We are also beginning to realize that we can get extended use out of our buildings during the summer months if those buildings are air conditioned.

Carpeting in schools is only now becoming accepted reluctantly, even if it must often be disguised under the name of "acoustical flooring material." Yet for years planners have known that the single most disruptive factor breaking the chain of communication between the student and teacher is the noise that originates at the hard surface under foot.

Electronic tools, audio-visual

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aids and other pieces of specialized equipment appear to be expensive when considered in terms of immediate dollar investment in both equipment and the personnel to operate the equipment. Yet there are educational programs that cannot be considered without the use of such tools. For example, schools across the nation were dismissed on the Monday of the John F. Kennedy funeral in 1963. Students were told over the school intercom system of the sorrow and grave historical consequences marked by that date and then they were released to go to their homes, the nearest drug store, hamburger shop, pool hall or any other facility in which there might be a television set on which *they could intimately share in one of the most important historical events that would occur during their lifetime. They might be anywhere but in the school for this experience, since the schools were ill-equipped, if equipped at all, with television sets on which they could all share this event under the guidance and counsel of the professional staff to whom they had been entrusted.*

In a school without television students who are affected so predominately by the launch of a space capsule, exposure to political conventions, meetings of the United Nations and a host of other international events — these students can only view these events secondhand as a re-run after school hours, assuming that they have the interest to watch or will be guided to the experience by someone other than their school counselors. Educational TV programs can easily originate in the school or be piped in from any center around the globe. They can be reproduced live or stored on video tapes and made available to the student and teacher at a moment's notice. Enrichment of the educational program through this medium is almost limitless and yet we are still shamefully piddling with the concepts and potentials — researching, debating and theorizing — and denying a generation of students the right to the fullest educational exposure we can easily implement.

Even in the matter of what a

school building should look like our attitudes are due for an overhaul. I have met with school planners who specifically requested that a school be so designed as to "look inexpensive and inconspicuous in the community," to avoid the possibility of objection from the taxpayers. Not too long ago I attended a school board meeting in a suburban Chicago community and had a terrible time finding the entrance to the factory-like, blockbuster building which seemed to have no front, no side, no character. Less money per square-foot had been put into the structure of a suburban bank just across the street — a gracious, charming building with high, arched colonnades, an inviting entry, a personality that will long remain in the memory of the visitor and passer-by and a credit to the community. So often we gnash our teeth and complain at the manners and habits of our school age youngsters who act as though they had been educated in chickencoops. Perhaps they were! It is time we broke the teeth of muttered platitudes such as "we don't want the school to be a monument." What is the better cause to which we should build monuments than the cause of education?

We must somehow reverse the trend toward building our schools to the lowest common denominator of taste and cost. Another of Dr. Barnard's statements of 1841 is acutely to the point today:

"In the construction of the schoolhouse — embracing its material, style of architecture and finish — as little care and taste are exhibited as might be expected from the indifference manifested in regard to its location and surrounding circumstances. Cheapness of construction seems, in most cases, to be the great governing principle, which decides upon its materials, its form and all its internal arrangements. No complaint on this score could justly be made if the general condition of these buildings were clearly and fairly attributed to want of ability. While our other edifices, both public and private, have improved in elegance, convenience and taste with the increasing wealth of our citizens our schoolhouses linger in

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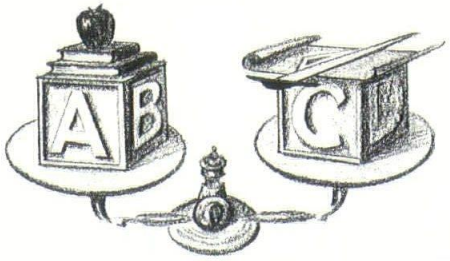
the rear and bear the impress of a former age."

I am full aware that there is a cry to reduce taxes in every segment of our society. I openly admit that I have no immediate recommendation as to where the increased funds for education will come from but if the public is not now informed and convinced of the need for larger outlays for education then our task is clearcut — we must somehow let them know the facts. This will not be accomplished by any of us involved in school planning if we are willing to justify our existence by seemingly delivering more education for less money, when in truth the budget has been trimmed only by whittling away at the services and facilities available in and through the schools.

In every area of educational need the escalator is going *up:*

. . . Enrollments are in a constant upward spiral, with no indication that this trend will be reversed in our time.

. . . The body of knowledge is growing at a fantastic rate, so that



each year there is infinitely more to be learned than there was in the year past.

. . . The tools needed for experimentation, research and instruction in the school are becoming more complex, more costly and they consume more space.

. . . The services demanded of the school in areas of instruction, recreation, counselling and medical and psychological care are riding the up escalator.

. . . Steady inflationary pressures on labor and material are constantly pushing building costs upward.

. . . Even the desire and request for increased community use of school facilities for adult recreation and education in the evening hours has pushed the level of utilization of these facilities up.

Yes, the escalator is going *up.* How can we expect to maintain our balance, much less get to higher levels of educational service, if we try to go *down the up escalator?* We've each in our time told the kids during the visit to the department store that there is no future in riding backwards on the up escalator — it's dangerous and you're still going to go up, no matter how you try to squirm out of it. At least if you're looking up you know what you are heading toward and can plan realistically for the future.

The future as we *can* shape it — if we *will* to shape it — holds an exciting potential for the image of the new school. It is obvious that it breaks markedly with that school of the past, based on the module of 30-35 students and one teacher, each in one cell of a series of cells lined up in a row and opening onto an apple-green corridor — the same layout used at Leavenworth and often producing just about the same educational results on the inmates when they get their release papers.

"The module of one," as Harold Gores calls it, has become the most significant design theme for the future school at all levels of education. We have come to realize that education is not something we do *to* a student but rather a process we encourage by working *with* the student, helping him to help himself. Whether the student at any time is working with a teacher, with other students, with a group of ten or thirty or in a group of 300 he is always an individual and must eventually find his own level of accomplishment, working at his own pace, achieving goals toward which he is constantly directed. In the new school we will try to get the program and the building out of his way.

I seriously doubt that the whole pattern of teaching will change completely in the next few years from the traditional teaching module to the module of one — we must logically allow time for the teachers themselves to adapt to the new concepts of individual counselling, team teaching, programmed teaching and learning, etc. However, new building designs, new space allocations and the use of new tools

will enormously improve the chances that the improvements will indeed come.

Planning for the new school, then, throws major attention on the space designed for individual study — the study carrel, the single-project laboratory, the electronic-laboratory station. These individual stations may be scattered anywhere throughout the school — within a classroom area, lining the corridors, in the library area, adjacent to the main laboratory or in the case of the university perhaps in the student lounge or dormitory. They may range in complexity from a quiet position at an ordinary table in a corner to a home-base for the student — a place where he stores his hat and coat, his reference materials and his typewriter, a place equipped with complete television and audio access to a variety of programs and reference materials, called to his carrel by the push of a button or flip of a dial. These are not concepts for the year 2000 — we have the hardware on the shelf right now to make this potential a present fact.

The need to bring the individual in close contact with the resources and reference services of the school also suggests that the library as we once knew it is being expanded into what is popularly called the "instructional materials center." This new concept requires more space and equipment than the former library, since emphasis is placed on providing more private space for the individual as well as more types of information and more types of equipment. We must plan the space, lighting and acoustic environment for books, micro-readers, audio stations, film presentations, teaching machines of all types, seminar discussions and informal lounge reference. This new library should also provide spaces in which the teachers can meet to plan their own programs, draw from the library resources and share time with their students. At least a portion of the audio-visual services of the school should be logically accommodated as a part of the instructional materials center or directly tangent to it, to be easily accessible to teacher, librarian and student alike.

Spaces for teacher, counselor and support services are all being revised to facilitate the closer relationships of teachers and their colleagues in implementing the changing school program.

Spaces for teaching in groups of varying size will be more carefully designed to meet their functional demands in this better school of the immediate future. Where audio-visual devices can be used to reach larger audience groups (groups of more than 25-30 students) ceiling heights will have to go up to get the screens for front projection and overhead projection in the proper position and at an adequate height so that all the students can see all that is on display. Wherever possible for the larger group seating will be tiered to allow for proper sight lines. With closer attention to creative lighting, we will recognize that all working-wall surfaces and wall displays will be specifically illuminated to the higher levels necessary for seeing a chalkboard demonstration or display material. Lighting for general room areas will probably be on dimmers or switches

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to allow for changes of light level to meet the need of varying tasks within the space.

We must also be aware that the *functions* within the school we design today may change fifteen years from now . . . or three years from now, when a new superintendent comes into the district. In that case the school that is well planned in our time will incorporate the possibility of change in its basic architectural design. The shell of the structure, wherever possible, should allow for great flexibility of programming both today and tomorrow.

Our educational program must accommodate flexibility in many areas — flexibility of time scheduling, flexibility of student achievement, flexibility in the use of teaching and supervisory personnel, flexibility in the availability of spaces of a variety of sizes and shapes, flexibility in acceptance of new tools and equipment as they come along.

Thus we can broadly visualize the new school building as a shell or loft enclosing highly mutable space. The walls in some areas will be demountable or removable by one technique or another, perhaps to change spaces over a weekend or summer recess. Some walls may be immediately movable at the press of a button to divide large spaces into smaller spaces, in the time it takes to move the students through the building. The shapes of the spaces will take the shape the function demands and it follows that the shape of the total school may well outdate the rectangular box of the past. The wedge, the octagon and the hexagon are all becoming familiar layout forms on the drawing board because they work better than the rectangle or the square for many purposes of school function.

Foremost, I hope it is evident that the design of a school is one of the most demanding, complex challenges facing our society today. Our investment of dollars and creative ingenuity to meet this challenge are not simply a matter of choice — they represent the key to our survival.

We must remind ourselves that

the student at any age is a highly impressionable member of the human race, upon whose success we depend for our future — not a second rate citizen to be contained each day in an educational warehouse with second rate facilities.

The value of design of our buildings does not rest with the creative capabilities of the architect alone. Educational planners must assume more responsibility for clearly delineating the *educational specifications* and *performance specifications* of their programs so the eventual form of the building will allow and enhance the educational function.

And last — or first — we must recognize that the value of the schoolhouse is not measured by dollars alone. Some communities have built expensive and impressive structures that gather design awards but are still ineffectual structures for the task of the student and teacher. On the other hand some of the most intriguing and best designed schools in the nation are going up at moderate cost, in the largest metropolitan centers, where the pressures for low cost and high performance are at their highest.

Associates Named

Carter and Woodruff, AIA of Nashua, is pleased to announce that James Mitchell, Alvin Corzilius and David Cheever are now Associates of that firm.

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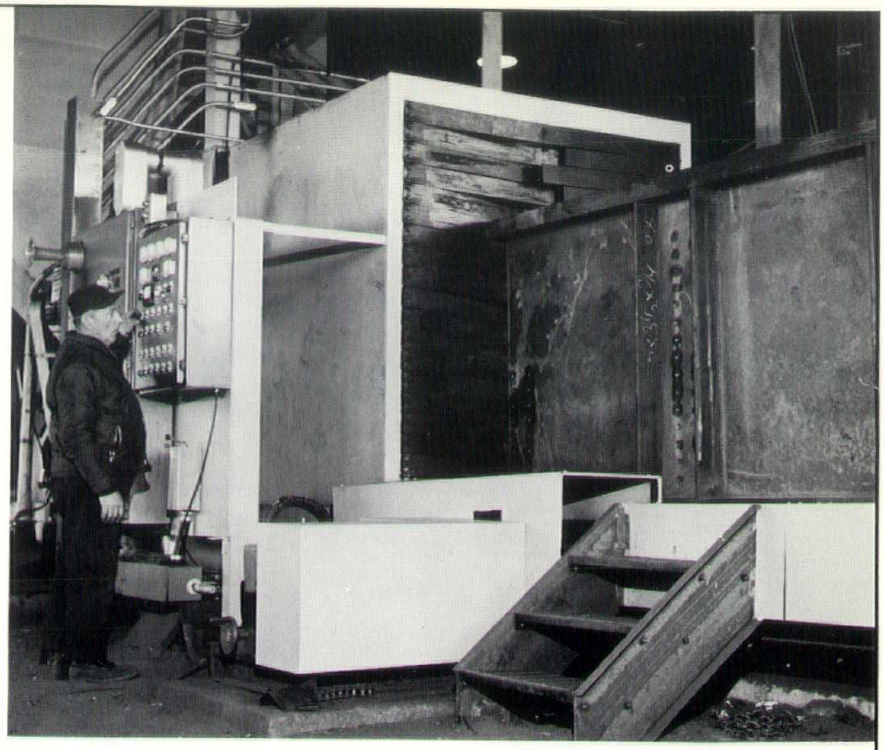

9:01 a.m.

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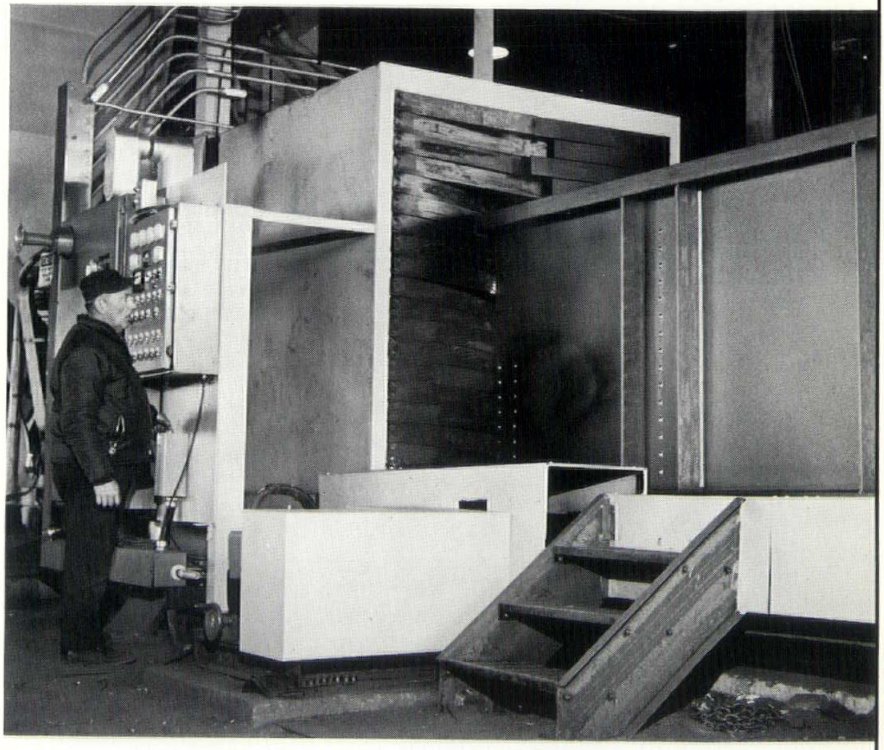

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